

Theory:

Food analysis: significance; Sampling: techniques, preparation, preservation; Physical properties and analysis of foods and food products: appearance, texture, specific gravity, refractive index, rheology; Chemical analysis: significance; Proximate analysis: moisture, ash, proteins, lipids, carbohydrates, fiber, NFE, acidity, pH, sugars, mineral elements, vitamins – significance, methods; Chromatography: paper, thin layer; Spectroscopy: atomic emission, atomic absorption; Sensory evaluation of foods: attributes, difference and preference tests, consumer acceptance. Overview of the commonly employed statistical methods.

Practical :

Lab safety requirements; Preparation and standardization of laboratory solutions; Sampling; Determination of specific gravity, refractive index, moisture, ash, crude protein, crude fat, crude fiber, NFE, pH and acidity; Estimation of vitamin C; Determination of mineral elements through flame photometer and atomic absorption spectrophotometer; Paper and thin layer chromatography; Identification of toxins by TLC; Sensory evaluation of foods.

Suggested Readings:

1. AOAC. 2016. Official Methods of Analysis of AOAC International, 20th ed. Association of Official Analytical Chemists, Arlington, USA.
2. Awan, J.A. and S.U. Rehman. 2015. Food Analysis Manual. Unitech Communications, Faisalabad, Pakistan.
3. Cruz, R.M.S., I. Khmelinskii and M. Vieira. 2014. Methods in Food Analysis. CRC Press. Taylor & Francis Group, Boca Raton, F.L, USA.
4. Pomeranz, Y. and C.E. Meloan. 2000. Food Analysis: Theory and Practice, 3rd ed. Chapman & Hall, New York, USA.
5. Winton, A. and K.B. Winton. 2006. Techniques of Food Analysis. Agrobios Publishing Co., Jodhpur, India.

FIFTH SEMESTER

| Course No. | Title of Course | Credit Hours |
|------------|-------------------------------------|--------------|
| HND | Dietetics-I | 3(2-1) MC |
| HND | Nutrition and Psychology | 3(3-0) MC |
| HND | Nutritional Education and Awareness | 3(2-1) MC |
| HND | Meal Planning and Management | 3(2-1) MC |
| HND | Public Health Nutrition | 3(2-1) MC |
| FST | Food and Drug Laws | 2(2-0) MC |
| | | 17 (13-4) |

HND DIETETICS-I 3 (2-1)

Learning Outcomes:

- To understand the discipline of dietetics and its role in human wellbeing

- To familiarize with the foundations of healthy diets and their role in disease prevention and management
- To acquaint hands-on training for calorie calculation and menu planning using food composition table and data bases
- To assess BMI and energy expenditures in relation to overweight and obesity

Theory:

Dietetics: definitions, history, importance; Dietitian: role in food service and clinical practice, responsibilities in multidisciplinary team, code of ethics; Foundations of healthy diet: Dietary Reference Intakes, Recommended Dietary Allowance, Food Guide Pyramid and allied approaches, Dietary Guidelines, Exchange system and menu planning; Energy expenditure and basal metabolism; Body mass index; Role of diet in disease conditions; Diet therapy and its principles; Food selection and factors affecting its acceptance; Nutrient density; Alternative patterns of food consumption; Nutritional counselling in clinical practice. Critical diet assessment. Nutrition and diet clinics.

Practical:

Interpretation of food guide pyramid, MyPyramid, Myplate, Eatwell Plate; Energy value of different foods: carbohydrates, fats, proteins; Calculating energy requirements; BMI in relation to obesity and overweight, energy and calorie requirements; Balanced diet and menu planning using exchange lists, food composition tables & data bases; Food intake analysis: Dietary Recall, Food Frequency Questionnaires, Food Surveys.

Suggested Readings:

1. Mahan, L.K., S. Escott-Stump and J.L. Raymond. 2012. Krause's Food, Nutrition & Diet Therapy, 13th ed. Elsevier Saunders, St. Louis, Missouri, USA.
2. Mudambi, S.R. and M.V. Rajagopal. 2007. Fundamentals of Foods, Nutrition & Diet Therapy, 5th ed. New Age International Pvt. Ltd. Publishers, New Delhi.
3. Punekar, M. and J. D'Souza. 2010. Handbook of Applied Nutrition, Dietotherapy and Diet Management. SBS Publishers & Distributors Pvt. Ltd., New Delhi.
4. Rawat, S. 2015. Applied Nutrition. Random Publication, New Delhi.
5. Schlenker, E. and J.A. Gilbert. 2015. Williams' Essentials of Nutrition and Diet Therapy, 11th ed. Elsevier/Mosby Inc., Louis, Missouri.
6. Singh, J. 2008. Handbook of Nutrition and Dietetics. Lotus Press, India.

HND NUTRITION & PSYCHOLOGY 3 (3-0)

Learning Outcomes:

- To understand psychology, its types and importance in nutrition
- To abreast the impact of psychological influences on appetite and attitude behavior relationship

Theory:

Psychology: introduction, types, classification; Psychology and nutrition adherence; Attitude and eating patterns and the field of cognitive psychology; Perception, visualization and eating patterns, errors in perception process; Eating disorders: diagnosis, assessment and treatment; Face perception; Conceptual model of food choice; Psychological influences on appetite; Process over the life course, integration of biological, social, cultural and psychological influences on food choice; Understanding behaviour: sensation, sense organs/special organs, attention and concentration, memory and its stages, methods for improvement, types and theories of thinking, cognition and levels of cognition, problem solving and decision making strategies, attitude behavior relationship; Measurement issues, indirect effects of attitude on behavior; The theory of reasoned action; Additional variables within the theory of planned behavior; Personality and intelligence; Stress management.

Suggested Readings:

1. Blackman, M.C. and C.A. Kvaska. 2011. Nutrition Psychology: Improving Dietary Adherence. Jones and Bartlett Learning Publishers, Ontario, Canada.
2. Booth, D.A. 1994. The Psychology of Nutrition. Taylor & Francis Inc., Bristol, PA, USA.
3. Elmes, D.G., B.H. Kantowitz and H.L. Roediger. Research Methods in Psychology, 9th ed. Wadsworth Cengage Learning, Belmont, CA, USA.
4. Jane O. 2010. The Psychology of Eating: From Healthy to Disorders Behavior, 2nd ed. Wiley Blackwell, John Wiley & Sons Ltd., Chichester, West Sussex, UK.

HND NUTRITIONAL EDUCATION AND AWARENESS 3 (2-1)**Learning Outcomes:**

- To learn the techniques of creating awareness about health issues in masses
- To acquire information about different modes of communication and their effective use
- To understand the ethical responsibilities for dissemination of knowledge

Theory:

Nutrition education: introduction, history, need, competencies and skills, framework, training needs, new development; Nutrition education programs: scope and challenges of educating people about eating well; Biological influences, cultural and social preferences; Education and communication strategies for different groups and settings; Evaluation of nutrition education programs; Family and psychological factors; Expectancy-value theories of motivation, social and cognitive theory; Behavior change as a process, phases of change; Addressing multiple and overlapping influences on behavior; A logical model approach for planning a framework of nutrition education;

Understanding communication model, preparing/organizing oral presentations, delivering oral presentation, delivering nutrition education workshops, types of supporting visual aids, nutrition mass media communication campaigns, social marketing; Ethics in nutrition education, conflicts, participating process in community coalition; Non-government and public health organizations and their current programs.

Practical:

Nutritional counselling; Program designing for specific diseases like anemia, neural tube defects, rickets, etc.; Surveys and seminars in different educational institutions; Individual presentations by students on different nutrition topics; Visits of public places for nutrition awareness; Independent student projects.

Suggested Readings:

1. Contento, I.R. 2007. Nutrition Education: Linking Research, Theory and Practice. Jones and Bartlett Publishers, Ontario, Canada.
2. FAO. 1997. Nutrition Education for the Public: Discussion Papers of the FAO Expert Consultation. Food and Agriculture Organization of the United Nations, Rome, Italy.
3. Semba, A.D. and M.W. Bloem. 2008. Nutrition and Health in Developing Countries, 2nd ed. Humana Press, New York, USA.
4. Walter, W. 2013. Nutritional Epidemiology, 3rd ed. Oxford University Press, New York, USA.

HND MEAL PLANNING AND MANAGEMENT 3 (2-1)

Learning Outcomes:

- To understand the importance of meal planning and its role in everyday life
- To apply the principles of meal planning in the planning of balanced and appropriate meals keeping in mind the nutritional requirements, family budget and food requirements choices of different age groups
- To identify market trends and conditions while purchasing food keeping in mind food costs and quality

Theory:

Importance and principles of meal planning for family and occasions; Nutritional value of meal; Family meal budgeting; Rules for good menu planning; Menu planning for families; Selection of various foods in relation to season and market conditions; Composition and storage of food; Selection, use and care of table appointments; Study of different types of table settings, table manners and etiquettes; Kitchen safety and settings; Basics of food hygiene and sanitation; Food labelling; Menus for schools, geriatric and healthcare centers.

Practical:

Survey and record keeping of market prices (retail & wholesale); Types of foods available in the market from different food groups. e.g. retail cuts of meat and types of milk; Comparison of weight, volume and effect of cooking on color, taste

and texture of different foods; Planning, preparation and service of meals for different occasions at different income levels; Understanding food labels; Market visits for cost and quality and food marketing regulations. Food service visits (Restaurants, School, Colleges, Hospitals).

Suggested Readings

1. Brown, A. 2015. Understanding Food Principles & Preparation, 5th ed. Cengage Learning, Belmont, CA, USA.
2. McWilliams, M. 2012. Fundamentals of Meal Management, 5th ed. Dorling Kindersley India Pvt. Ltd., New Delhi, India.
3. Narvaez-Soriano, S. 2004. A Guide to Meal Management and Table Services. Rex Book Store, Manilla, Philippine.
4. Sethi, M. 2008. Institutional Food Management. New Age International Pvt. Ltd. New Delhi, India.

HND PUBLIC HEALTH NUTRITION 3 (2-1)

Learning Outcomes:

- To figure out global and local scenario of public health nutrition
- To understand the core concepts and assessment methods at the population level
- To acquaint hands-on training for development of policies related to nutrition and possible gaps in the matrix of nutrition policies

Theory:

Public health nutrition: overview, concepts, determinants, foundations; Disease burden and its control; Health promotion and disease prevention; Modes of intervention, monitoring and surveillance; Safety and health at work place; Public health nutrition: assessment and programs. Nutritional surveillance and growth monitoring; Public health policies and strategies; Marketing nutrition programs in public; Public health nutrition: a field of practice; Public health nutritionist: competencies, duties, responsibilities, ethics.

Practical:

Food and nutrition surveys for monitoring of public health; Community need assessment; Planning, implementation and monitoring nutrition intervention program based on the need assessment of the community; Marketing nutrition programs in the public; Visit of various public health departments.

Suggested Readings:

1. Edelstein, S. 2011. Nutrition in Public Health: A Handbook for Developing Programs and Services, 3rd ed. Jones & Bartlett Learning, Sudbury, M.A, USA.
2. Gibney, M.J., B.M. Margette and J.M. Kearney. 2004. Public Health Nutrition. Blackwell Science Ltd. Oxford, UK.
3. Lawrence, M. and T. Worsley. 2007. Public Health Nutrition: From Principles to Practice. Allen & Unwin Book Publishers, Australia.

4. McKenzie, J.F. and R.R. Pinger. 2015. An Introduction to Community & Public Health. 8th ed. Jones & Bartlett Learning, LLC Burlington, MA, USA.
5. Spark, A. 2007. Nutrition in Public Health: Principles, Policies and Practice. CRC Press, Taylor & Francis, Boca Raton, FL, USA.

FST FOOD AND DRUG LAWS 2 (2-0)

Learning Outcomes:

- To get know how about the existing food and drug laws prevailing in the country
- To understand duties and authorities of food safety officers and drug inspectors
- To familiarize with food and drug laws enforcement agencies in Pakistan

Theory

Punjab Pure Food Rules 2011: legal terms and definitions from the food industry; Rules for food additives, categories, permissible limits; Food packaging: rules, criteria for packaging material, labelling requirements; Duties and responsibilities of public analysts and food safety officer; The Drug Regulatory Authority of Pakistan Act, 2012; DRAP Alternative Medicines and Health Products Enlistment Rules 2014; Halal food dietary laws. Consumer protections laws in Pakistan; The Punjab Consumer Protection Rules 2009; The Punjab Consumer Protection Act 2005; The Pakistan Hotels and Restaurants Act, 1976; The Punjab Food Authority Act 2011; The Pakistan Halal Authority Act 2015; Pakistan National Accreditation Council; Punjab Halal Development Agency; Pakistan Standards and Quality Control Authority (PSQCA); Role of electronic and print media in public awareness and empowerment.

Suggested Readings:

1. GOP. 2005. The Punjab Consumer Protection Act 2005. Government of the Punjab, Lahore, Pakistan.
2. GOP. 2011. Punjab Pure Food Rules 2011. Health Department, Government of the Punjab, Lahore, Pakistan.
3. GOP. 2012. Drug Regulatory Authority of Pakistan Act, 2012 *The Drug Regulatory Authority of Pakistan*, Government of the Pakistan, Islamabad.
4. GOP. 2015. *Pakistan Halal Authority Act, 2015*. Minister for Science and Technology, Government of the Pakistan, Islamabad.
5. Independent topics for readings.